Women’s empowerment mitigates the negative effects of low production diversity on maternal and child nutrition in Nepal

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Why agriculture for nutrition?

- Agricultural growth and development is effective in reducing poverty, but do NOT necessarily translate into improved nutrition outcomes.
- A wide body of literature demonstrates that links between agriculture, health and nutrition are dynamic and multifaceted (Gillespie 2001; Headey 2011; Hoddinott 2011).
- How should agricultural policies and programs be designed and implemented to achieve nutritional objectives?
Gender matters!

• 6 pathways through which agricultural interventions can affect nutrition (Ruel and Alderman 2013):
  1. Agriculture as a source of food for own consumption
  2. Agriculture as a source of income
  3. Agricultural policies on prices of food and nonfood crops
  4. Effects of women’s social status and empowerment on their access to and control over resources
  5. Impact of women’s participation in agriculture on their time allocation
  6. Impact of on women’s participation in agriculture on their own health and nutritional status

ALL MEDIATED BY GENDER ROLES
What this paper tries to do

• Hypothesize that both production diversity and women’s empowerment are important determinants of maternal and child nutrition in rural semi-subsistence households such as in Nepal

• Does women’s empowerment mitigate the effect of low production diversity on nutrition, or does it exacerbate it?
Women’s Empowerment in Agriculture Index (WEAI)

• Key aspect of index construction: similar to family of multi-dimensional poverty indices (Alkire and Foster 2011, J of Public Econ) and the Foster-Greere-Thorbeck (FGT) poverty indices

• Innovative because it uses interviews of the primary male and primary female adults in the same household

• Focus is strictly on empowerment in agriculture, distinct from economic status, education, and empowerment in other domains

• Details on index construction in Alkire et al. (2013), World Development
How is the Index constructed?

WEAI is made up of two sub indices:

- **Women’s Empowerment in Agriculture Index (WEAI)**
  - Five domains of empowerment (5DE)
    - A direct measure of women’s empowerment in 5 dimensions
  - Gender parity Index (GPI)
    - Women’s achievements relative to the primary male in hh

All range from zero to one; higher values = greater empowerment.
Five Domains of Empowerment (5DE)

Ten Indicators
- Input in productive decisions 1/10
- Autonomy in production 1/10
- Ownership of assets 1/15
- Purchase, sale, or transfer of assets 1/15
- Access to and decisions on credit 1/15
- Control over use of income 1/5
- Group Member 1/10
- Speaking in Public 1/10
- Leisure 1/10
- Workload 1/10
A woman who has achieved ‘adequacy’ in 80% or more of the weighted indicators is empowered.
Data

• Baseline survey of an impact evaluation for *Suaahara*, a USAID funded multisectoral intervention, to address maternal and child undernutrition in Nepal
• Data collection: June 13- Oct 6, 2012 – New Era, IFPRI
• 4,080 households in 240 communities across 16 districts in 3 AEZs
### Survey Questionnaires: Household Level

<table>
<thead>
<tr>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>❖ Child Health and Childcare</td>
<td>❖ Household Roster</td>
</tr>
<tr>
<td>❖ IYCF Practices</td>
<td>❖ Household Economics</td>
</tr>
<tr>
<td>❖ Household Food Security</td>
<td>❖ Social Assistance</td>
</tr>
<tr>
<td>❖ Maternal Dietary Diversity</td>
<td>❖ Agricultural Practices and Land Use</td>
</tr>
<tr>
<td>❖ <strong>Empowerment</strong></td>
<td>❖ <strong>Empowerment</strong></td>
</tr>
<tr>
<td>❖ Information Access</td>
<td>❖ House and WASH Observations</td>
</tr>
<tr>
<td>❖ Maternal Health</td>
<td></td>
</tr>
<tr>
<td>❖ IYCF Knowledge and Beliefs</td>
<td></td>
</tr>
<tr>
<td>❖ Water, Sanitation, and Hygiene</td>
<td></td>
</tr>
<tr>
<td>❖ <strong>Anthropometry</strong> and Hemoglobin</td>
<td></td>
</tr>
<tr>
<td>❖ Grandmother’s Perspectives</td>
<td></td>
</tr>
</tbody>
</table>
1. Child level
   - Child anthropometry (HAZ; WAZ; WHZ)
   - Child dietary diversity using WHO recommended 7 food groups
     - Starchy staples; Beans, lentils and nuts; dairy; eggs; and all flesh foods including meat, fish, and poultry; vitamin A-rich fruits and vegetables; other fruits and vegetables

2. Maternal level
   - BMI (kg/m²)
   - Dietary diversity using 9 food group indicator
     - Starchy staples; Beans, lentils and nuts; Dairy; Meat; Eggs; Fish; Green leafy vegetables; Vitamin A rich fruits & vegetables; Other fruits and vegetables
Key explanatory variables

1. Agriculture production diversity
   – A 9 group production diversity index (PDI) analogous to the 9 food groups used for maternal dietary diversity

2. WEAI
   – Aggregate 5DE score
   – Decomposed indicators: Group membership; Control over use of income; Autonomy in production; Workload (indicators with largest contributions to women’s disempowerment)
   – Gender parity gap (for households with both male and female respondents)

3. WEAI x PDI
WEAI Diagnostics

% Contribution of domains & indicators to women’s disempowerment

- Production: 23.5%
- Resources: 18.9%
- Income: 20.5%
- Leadership: 19.4%
- Time: 17.7%

- Input into production decisions: 14.6%
- Asset ownership: 5.0%
- Access to and decisions on credit: 4.3%
- Group membership: 3.9%
- Workload: 16.6%

- Autonomy in production: 17.7%
- Rights over assets: 10.7%
- Control over use of income: 6.3%
- Speaking in public confidence: 18.5%
- Leisure: 17.7%
## Empowerment measures

<table>
<thead>
<tr>
<th>Model #</th>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aggregate empowerment</td>
<td>woman’s 5DE score, the weighted average of achievements in the ten indicators</td>
</tr>
<tr>
<td>2</td>
<td>Autonomy in production</td>
<td>Relative Autonomy Index (RAI) score</td>
</tr>
<tr>
<td>3</td>
<td>Control over income</td>
<td># ag and nonag activities in which she has input in income decisions or feels she can make decisions</td>
</tr>
<tr>
<td>4</td>
<td>Group membership</td>
<td># of groups in which she is an active member</td>
</tr>
<tr>
<td>5</td>
<td>Workload</td>
<td># hours worked in paid and unpaid activities</td>
</tr>
<tr>
<td>6</td>
<td>Gender parity gap</td>
<td>gap between 5DE scores of men and women; =0 if woman is empowered</td>
</tr>
</tbody>
</table>
Empirical specification

\[ N = b_0 + b_1 \text{empowerment} + b_2 \text{production diversity} \\
  + b_3 (\text{empowerment} \times \text{production diversity}) + b_4 I + b_5 H + \nu \]

\( N \) – nutrition outcomes; \( I \) – individual characteristics; \( H \) – household characteristics

- Controls:
  - \textit{Child characteristics:} under 2 years old dummy, girl dummy, age (in months), age squared
  - \textit{Mother characteristics:} age, age squared, height, years of schooling
  - \textit{Household characteristics:} household size, dependency ratio, socio-economic status index, caste dummies, intervention group dummy, agro-ecological zone dummies
  - \textit{Climate variables:} rainfall, temperature

- Estimation
  - OLS, interpreted as correlations, not causal
  - Estimated for different subsamples of households (sole male DM, both male & female DM, sole female absent male, sole female DM)
## Key findings

<table>
<thead>
<tr>
<th></th>
<th>Production diversity</th>
<th>Women’s empowerment</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal DD</td>
<td>↑</td>
<td>↑ (empowerment score, group membership, control over income)</td>
<td>↓ (empowerment score, group membership)</td>
</tr>
<tr>
<td>Maternal BMI</td>
<td>↓ (female DM absent male)</td>
<td>↓ (workload)</td>
<td>↑ (workload, female DM absent male)</td>
</tr>
<tr>
<td>Child DD</td>
<td>↑ (except in HHs where male absent)</td>
<td>↓ (gender parity gap)</td>
<td>↑ (gender parity gap)</td>
</tr>
<tr>
<td>Child HAZ</td>
<td></td>
<td>↓ (gender parity gap)</td>
<td>↑ (gender parity gap)</td>
</tr>
<tr>
<td></td>
<td>↑ (some models)</td>
<td>↑ (control over income)</td>
<td>↑ (control over income)</td>
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Key findings

• Production diversity is positively associated with maternal and child dietary diversity, and children’s WHZ, WAZ

• Domains of empowerment that are significant for mother and child nutrition may not always overlap
  – Group membership, control over income, reduced workload, and overall empowerment score are positively associated with better maternal nutrition
  – Control over income is associated with better HAZ, lower gender parity gap improves children’s diets and HAZ

• Women’s empowerment mitigates the negative effect of low production diversity on maternal and child dietary diversity and HAZ
  – Women’s empowerment has greater potential to improve nutrition in households with less diverse production
To conclude...

- In this context, where only a negligible share of production is sold, agricultural interventions that promote diversification may improve nutrition outcomes.

- Increasing production diversity, if increasing work intensity of women in labor-scarce households, may not improve maternal BMI.

- Different aspects of empowerment matter for different nutrition objectives – policy response will be different.

- Suggestive evidence that women’s empowerment has a greater positive effect on child diets and HAZ in hhs with lower production diversity:
  - In communities where diversification is limited by biophysical and agroecological characteristics, women’s empowerment may be another venue for improving child diets and long-term nutritional status.
  - Bundle women’s empowerment interventions with agricultural interventions to increase nutrition impact.
THANK YOU!